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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/716,117

11/18/2003

Yasushi Inda

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EXAMINER

ECHELMMEYER, ALIX ELIZABETH

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

03/11/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/716,117	<b>Applicant(s)</b> INDA, YASUSHI	
	<b>Examiner</b> Alix Elizabeth Echelmeyer	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-6 and 8-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6 and 8-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 5, 2009 has been entered.
2. Claim 1 has been amended. Claims 1, 3-6 and 8-17 are pending and are rejected for the reasons given below.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 15 depends from claim 1, which requires that the solid electrolyte and one of the electrodes exist in a mixed state in an interface between the electrolyte and electrode. This is enabled in the specification in the passages describing the method of

Art Unit: 1795

directly coating the electrolyte mix onto the electrode (see, for example, pages 8-9 of instantly filed specification). This is different from the method in which the resultant mixed state at interface is described (see page 14). The method resulting in the mixed state does not involve crystallization of an amorphous layer.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3-6, 8-12, 14, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. (US 4,828,945) in view of Inda et al. (US 6,475,677).

Nagata et al. teach a solid electrolyte battery including a lithium in conductive electrolyte material (abstract; column 1 lines 55-56).

The electrolyte layer is taught to be 10  $\mu\text{m}$  - 250  $\mu\text{m}$  (column 3 lines 63-68). Nagata et al. fail to teach specifically that the electrolyte must be less than 20  $\mu\text{m}$ , but do teach that the thickness of the electrolyte layer is important to the battery. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the thickness of the electrolyte layer such that all of the desired characteristics would be achieved. It has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 IIB

Nagata et al. further teach that the solid electrolyte mixture is used because of its good adhesion to the electrodes (column 5 lines 42-46). One of ordinary skill in the art at the time the invention was made would recognize that a mixed state of solid electrolyte and electrode would inherently occur between the electrolyte and electrode of Nagata et al., since in order for adhesion to take place, the electrolyte material would find its way into the roughened surface of the electrode material.

As for claims 3 and 14, the product by process limitations are not given patentable weight since the final product is the same. MPEP 2113.

With regard to claim 4, the electrolyte has conductivity of  $10^{-5}$  S/cm (column 1 lines 44-45).

Regarding claim 5, the lithium conductive powder is preferably in an amount of 55-95% (column 3 lines 47-55).

With further regard to claim 1 and regarding claims 8-10 and 16, Nagata et al. fail to teach that the lithium conductive material is a lithium ion conductive crystal or a lithium ion conductive glass-ceramic.

Inda et al. teach the use of a lithium ion conductive glass-ceramic in the solid electrolyte of a lithium battery (abstract).

Art Unit: 1795

Regarding claim 6, Inda et al. teach a lithium ion conductive glass-ceramic, thus meeting the limitation of claim 1. Claim 6 does not further limit the parent claim and is considered rejected because claim 1 is rejected.

As for claims 11 and 17, Inda et al. teach a powder of 20  $\mu\text{m}$ , but fail to teach that the powder is less than 1  $\mu\text{m}$  (abstract). Nagata et al. teach that the particle size is not defined (column 3 lines 1-3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the best particle size for the thickness of the electrolyte.

As for claim 12, Nagata et al. teach that the powder is in a polymer medium (column 3 lines 47-55).

Inda et al. further teach that the lithium ion conductive glass-ceramic is desirable in solid electrolyte because it has high ion conductivity, provides mechanical strength even when the thickness of the electrolyte is reduced, has high cell capacity, improved charging-discharging characteristics and a long, stable cell life (column 1 lines 50-58).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a lithium ion conductive glass-ceramic as the lithium material of Nagata et al. as taught by Inda et al.

7. Claim 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. in view of Inda et al. as applied to claim 9 above, and further in view of Munshi et al. (US 6,645,675).

Art Unit: 1795

The teachings of Nagata et al. and Inda et al. as discussed above are incorporated herein.

Nagata et al. in view of Inda et al. fail to teach the inclusion of a lithium inorganic salt in the solid electrolyte.

Munshi et al. teach the use of a salt in a solid electrolyte also including a polymer and a lithium ion conductive inorganic substance to aid in ion mobility (column 2 lines 12-17; column 6 lines 29-35).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a lithium salt in the electrolyte of Nagata et al. in view of Inda et al. as taught by Munshi et al. in order to aid in ion mobility.

### ***Response to Arguments***

8. Applicant's arguments have been considered but are moot in view of the new ground of rejection, see above. The new ground of rejection was necessitated by the amendment.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

Art Unit: 1795

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795

Alix Elizabeth Echelmeyer  
Examiner  
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